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# THE PROFESSIONAL EXPERIENCE TO PESTCIDES AMONG FARMERS

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**Abstract:**
***Objective:*** *The workers of the agriculture field experience the risk of pesticides. The contact to pesticides is the cause of many problems of health. The purpose of this research work was the assessment of the effect of pesticides on the hematological features among the farmers of the southern areas of Punjab.*
***Methodology:*** *In this research work, fifty-four farmers experienced to pesticides and fifty-four healthy controls were the participants. The calculation of the parameters of the blood, count of the cells & coagulation factors carried out in both groups.*
***Results:*** *The age of the participants was from seventeen to sixty-five years with an average age of 35 ± 8 years. The results displayed that all the parameters were in normal range. The levels of hemoglobin, red blood cells, Hct, platelets & PT in the group of the patients were more as compared to the group of the healthy controls.*
***Conclusion:*** *In this research work, the indexes of blood and its formation organisms were change in the group of the patients but these indexes were not significant as compared to the range in the controls. It was decided that red blood cells, hemoglobin, platelets & PT are valuable indexes as caution signals for early detection of the poisoning because of pesticides.*
**Key Words**: *Red Blood Cells, Hemoglobin, Organisms, Endocrine, Infectious Diseases, Hematological, Prothrombin.*

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## INTRODUCTION:

Pesticides are the substances or the combination of the substances used for the mitigation of the pest [1, 2]. It is estimation that organophosphate is poisoning 3 million people every year in the whole world. Out of the mentioned amount 3 hundred thousand individuals either seriously hurt or die because of poisoning [3]. The high use of the pesticides is increasing the pollution in the whole world. Pesticides are very dangerous and are being used to kill the organisms which are unwanted. When the pesticides are applied to the soil, they may be penetrating into the waters of the surface and affect the life of the aquatic organisms [4, 5]. The pesticides are very useful against the pest in the agriculture field but the dangers they create is a main focus of the interest for the world because their utilization has directed to various impacts of the health risks on non-targeted organisms, especially human's populations [6].

The extensive utilization of pesticides leads to the contacts of the farmers, ecosystem and in the last to the public for the probable toxic impacts for these drugs [7, 8]. Professional contact to these pesticides in the farm related to an enhanced danger of the creation of some serious diseases [9, 10]. Many research works have concluded relationships among contact to the chemicals of the agriculture field & different health findings, including various tubes of tumors and other infectious diseases [11-13]. The impacts in nervous, blood, immunity, reproductive and endocrine systems are under consideration and these pesticides also have an association with the damage of DNA in the cells of human being [14-18]. Biomarkers can be utilized to identify the dangerous impacts of these compounds before the occurrence of the problems of health. The main objective of this research work is to know about the impact of these compounds on the hematological alterations among the farm workers. The outcome of this research work can be helpful in the medical field to help out the person infected by these chemical compounds.

## METHODOLOGY:

This transverse research work carried out in the non-urban areas of Punjab. One hundred and eight persons with seventeen to sixty-five years of age were the participants of this research work and their separation carried out in patient and healthy control group. Fifty-four farmers who were exposed to these chemical compounds were the members of the patient group and the selection of the healthy control carried out from the general population who has no exposure to these harmful compounds. For the examination and analysis of the hematological features, the collection of two milliliters blood carried out from every participant with the utilization of anticoagulant EDTA. The count of RBC (Red Blood Cells) (x106 mm-3), amount of the WBC (White Blood Cells), amount of platelet (x103 mm-3) & Hb (Hemoglobin) g/ dL-1, values of hematocrit (HCT), MCV (mean corpuscular volume) fl, MCH (mean corpuscular hemoglobin) pg, MCHC (mean corpuscular hemoglobin concentration (g dL-1) were created by the counter of cell (Koobas micros sixty).

In the same manner, two milliliters sample of blood was gathered into the citrate for the discovery of ESR (Erythrocyte Sedimentation Rate), with the support of win Trobe pipette. At the same moment, 2 milliliters sample of blood stored in citrated tubes & without delay utilized for examination of PT (prothrombin Time) & PTT (partial prothrombin). Ethical committee gave the approval of this research. SPSS software version seventeen was in use for the analysis of the collected data. T test was in use for the comparison of both groups. P value of less than .05 was considered as significant.

## RESULTS:

The average age of the patients and controls was 35 ± 8 years. Table-1 displays that the pesticides were in use by the farmers who were declared as cases or patients.

**Table-I: Pesticides Used by Case Group.**

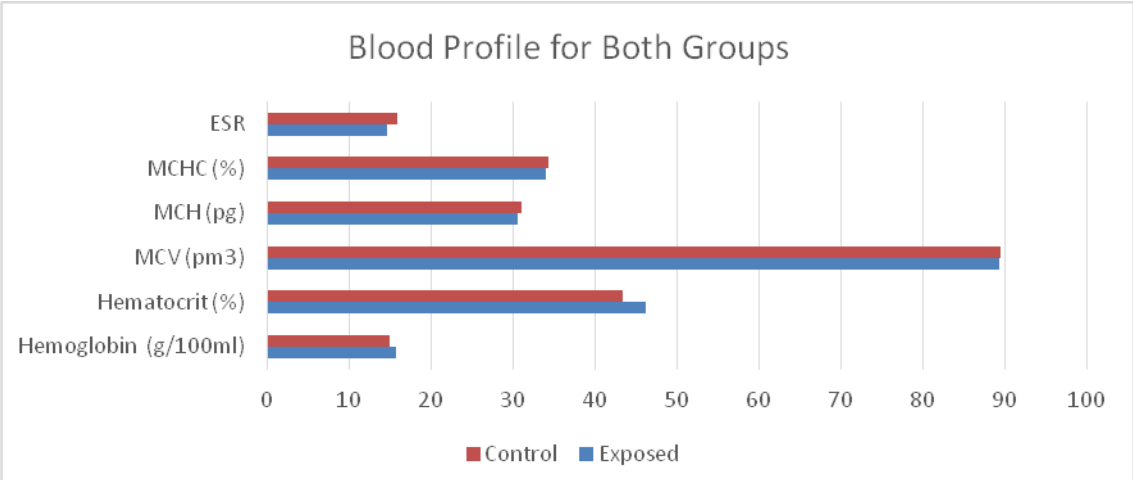
| General name | Trade name | Type | $^{LD}50$ |
|---|---|---|---|
| Endosulfan | Thiodan | organoclorate | 30.0 |
| Paraquat | Gramoxone | herbicide | 150.0 |
| Permethrin | Ambush | insecticide | 500.0 |
| Propargite | Omite | insecticide | 2200.0 |
| Profenofos | Curacron | organophosphate | 358.0 |
| Thiodicarb | Larvin | carbamat | 166.0 |
| Tribenuron methyl | Granstar | herbicide | <5000 |
| 2,4-D | U46 | herbicide | 699.0 |
| Diazinon | Basudin | organophosphate | 300.0 |
| Diclofop methyl | Illuxan | herbicide | 563.0 |
| Fenvalerae | Sumicidin | insecticide | 141.0 |
| Mancozeb | Dithane M-45 | fungicide | 11200.0 |
| Haloxyfop etoxy-ethyl | Gallant | herbicide | 518.0 |

He collected information displayed that all the hematological features parameters which were under examination were in typical range, while the analysis of hemoglobin, prothrombin time, red blood cells, platelets and partial prothrombin described important disparities in patient and control groups as described in Table-2, Table-3 & Table-4.

**Table-II: Blood Profile for both groups.**

| Parameter | Exposed | Control | P value |
|---|---|---|---|
| Hemoglobin (g/100ml) | 15.7830 ± 1.550* | 14.8980 ± 1.240 | 0.0020 |
| Hematocrit (%) | 46.210 ± 4.080* | 43.400 ± 3.510 | 0.0010 |
| MCV (pm3) | 89.330 ± 5.190 | 89.530 ± 9.660 | 0.8980 |
| MCH (pg) | 30.550 ± 2.620 | 31.070 ± 2.360 | 0.2870 |
| MCHC (%) | 33.980 ± 2.130 | 34.320 ± 1.270 | 0.3300 |
| ESR | 14.60 ± 10.520 | 15.860 ± 11.010 | 0.5780 |

*Statistically significant

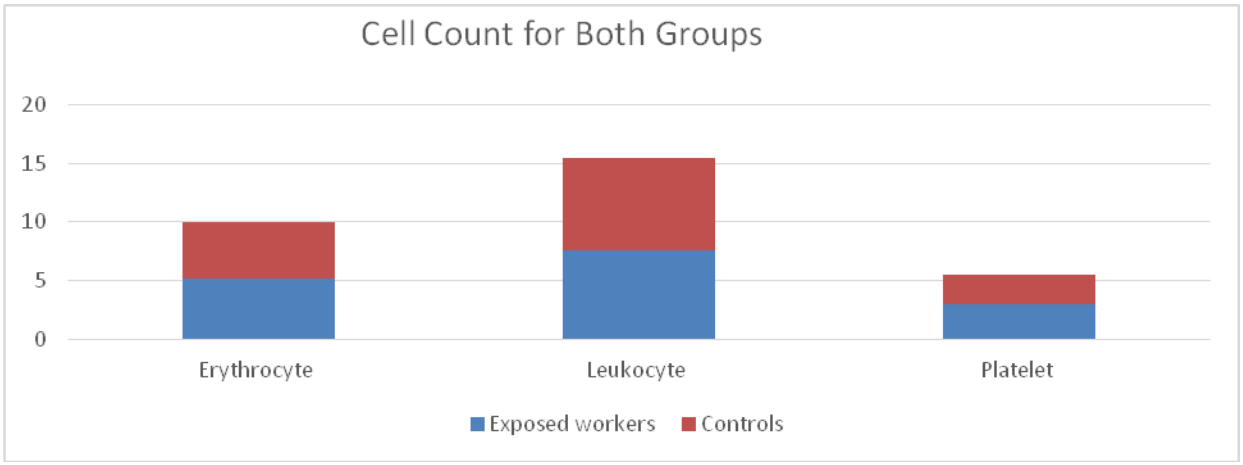


The values of these features were very high in the patients as compared to their healthy controls. Although the amount ESR was low in the group of control but it was not of much importance as described in Table-2. The amounts of the erythrocyte & platelet were very high in farmers as presented in Table-3.

**Table-III: Cell count of exposed and control groups (means ± SD).**

| Cells | Exposed workers | Controls | P value |
|---|---|---|---|
| **Erythrocyte** | 5.1990 + 0.5350* | 4.8130 + 0.4610 | 0.0010 |
| **Leukocyte** | 7.6050 + 0.20 | 7.8590 + 0.230 | 0.5550 |
| **Platelet** | 2.9380 + 0.70* | 2.550 + 0.680 | 0.0140 |

*Statistically significant

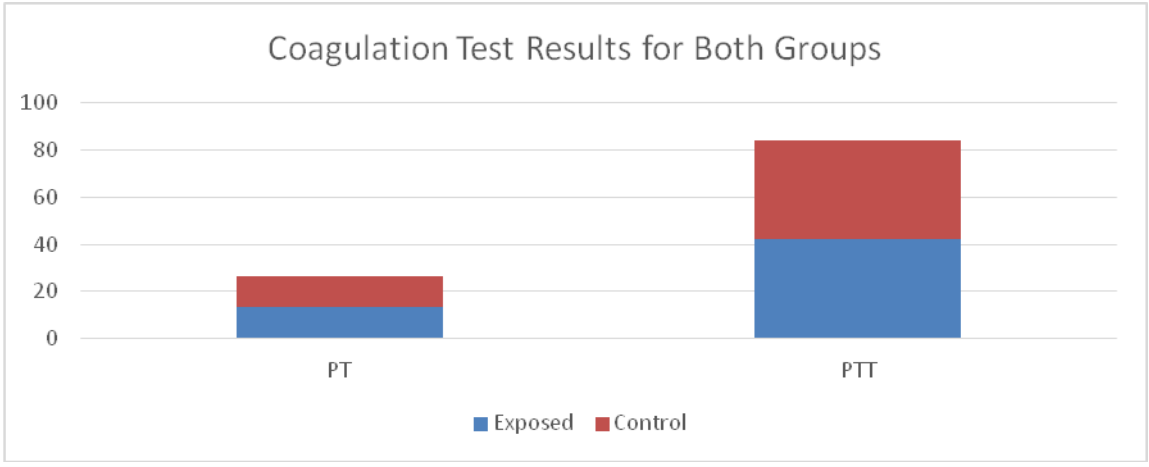



The levels of PT & PTT are very high among the farmers who were exposed but the alterations in only PTT were significant statistically as available in Table-4.

**Table-IV: Coagulation test results for both groups.**

| Test | Exposed | Control | P value |
|---|---|---|---|
| **PT** | 13.50 + 0.610* | 12.90 + 0.500 | 0.0010 |
| **PTT** | 42.30 + 7.810 | 41.50 + 1.350 | 0 .489 |

*Statistically significant



## DISCUSSION:

In this research work, the indices of hematology have alterations in the group of patients but this was not much important as compared to the normal range. Hemoglobin, Hct, red blood cells & platelet amounts were in high quantity but other indices were in low quantity. This information elaborated that pesticides has an impact on the cells of blood as well as the indices of red blood cells. The decrease in the MCV & enhancement in the red blood cells & Hct in this research work are same to the toxic impacts of the metals. It is showing that there is a same method of toxification among heavy metals & pesticides on the indices of the blood [19, 20], in another research work, the study of the impact of a fresh phosphorothionate conducted on wistar rats. After ninety days' hemoglobin, Hct & red blood cells amounts displayed an important decrease, but the amounts of MCV, MCH & MCHC levels were very high on the other hand [21]. In another research work on the impact of sulphur mustard on the victims of war, it was displayed that there was an increase in the amount of the red blood cells & Hct as compared to the healthy controls [22]. The impact of the actellic displayed that the frequency of red blood cells, Hct & hemoglobin was very low because of that insecticide in a patient vs. healthy control research work [23]. In another research work, there was a conclusion that cypermethrin was the main reason of decrease in the hemoglobin and red blood cells in rabbit [24]. These results were opposite to the findings of this research work. This opposite result depends upon the type of the pesticides utilized and the conditions of the expositions.

Jamil & his colleagues have concluded that white blood cells were high in the farmers who have experienced the pesticide but in this research work the amount of leukocytes were very low [25]. El-Sadek discovered that the amount of white blood cells & platelets in the group who was exposed to pesticides was very high as compared to the group of healthy controls [26]. WHO (World Health Organization) has concluded that there are some pesticides as Bentazone are the reason of increase in the amount of the platelet that is same as compared to the result of this research work [23]. The enhancement in the PT (prothrombin time) may be because of the liver dysfunction to the production of prothrombin that is also the conclusion of some other research works [25,26].

## CONCLUSIONS:

We found that red blood cells, hemoglobin, platelets & PT are very valuable indices of blood and best warning signals for the early detection of the poisoning because of pesticides. But some proper treatment to tackle this problem is available. A more detail research work is the requirement to discover which pesticide kind was in utilization by these populations.

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